April 1, 2003

ANALYSIS OF TOTAL ORGANIC CARBON (TOC) AT LOW LEVELS FOR GROUNDWATER RECHARGE REUSE PROJECTS (GRRPs)

In the Department of Health Services' draft Recharge Reuse Regulations*, dated August 2, 2002, Section 60320.040 Control of Nonregulated Contaminants, subsection (e) (page 9) states:

> Each GRRP shall operate its available treatment and recharge facilities to minimize any TOC concentration in the recycled water prior to recharge or in the mound (if approved for mound monitoring) that exceeds a TOC goal established by 0.3 mg/L by the Department-specified maximum average RWC [= Recycled Water Contribution] for the GRRP.

Hence, for a 100-percent recycled water project, the TOC goal would be 0.3 mg/L.

To monitor TOC at this low level, the Department recommends:

- Method 5310C, listed in Standard Methods for the Examination of Water & Wastewater 20th Edition (1998), as the appropriate method for TOC analysis for the reclamation and recycling of municipal wastewater
- A reporting level of 0.10 mg/L
- Precision and accuracy within +/-20%

In order to successfully use Standard Method 5310C for low-level measurements of TOC, the following laboratory practices are recommended.

Recommendations for Low-Level TOC Measurements by Standard Methods 5310C

(1) Use only new or scrupulously cleaned autosampler vials.

(2) If the autosampler vials are covered with septum caps, ensure that the septa are not touched with fingers. Use forceps to handle the septa.

(3) Pre-rinse the autosampler vials with the sample before filling them.

(4) Use a large enough sample aliquot for the analysis to achieve the required reporting limit of 0.10 mg/L.

(5) Procure reagents and water that produce consistently low reagent blanks.

(6) Use only peroxodisulfate reagent solutions that produce stable blank levels. Freshly prepared peroxodisulfate reagent solutions were found to produce higher blanks than solutions that were aged for several days. The decrease in the observed blank was most pronounced on the first day of use. The aging process and the reduction in blank levels can be accelerated by boiling the peroxodisulfate reagent for a short time period and then cooling it.

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* see http://www.dhs.ca.gov/ps/ddwem/publications/waterrecycling/recycledraftreg8-2-02.PDF